

Category 4, EN 954-1 PNOZ e3.1p



Safety gate monitor in accordance with EN 60204-1 (VDE 0113-1), 12/97 and IEC 60204-1, 10/97

Features

- Evaluation device for safety sensor PSEN 2.1p-10, PSEN 2.1p-11 and position switches
- Monitored or automatic reset can be selected
- 2 safety outputs and one auxiliary output using semiconductor technology
- Auxiliary output can be switched to a diagnostic output
- One AND and one OR input to form logic AND/OR connections between several units
- Monitoring of shorts across contacts can be selected
- Self test after U_B is applied
- Permanent self monitoring
- Periodic switch-off test on the safety outputs

Approval

| | PNOZ e3.1p |
|--|------------|
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| | ● |
| | ● |

| Technical details | PNOZ e3.1p |
|--|---|
| Application range | In accordance with EN 954-1, 07/96 Category 2, 3 or 4 Safety gate monitoring |
| Electrical data | |
| Supply voltage | 24 VDC |
| Tolerance | 80 ... 125 % |
| Power consumption | With no load: 2 W |
| Residual ripple DC | 20 % |
| Outputs | 2 safety outputs 1 auxiliary output |
| Switching capability | $U_B \leq 26.5$ V: 2 outputs under load: 2 A/50 W 1 output under load: 2.7 A/70 W $U_B > 26.5$ V: 2 outputs under load: 1.5 A/40 W 1 output under load: 2.2 A/50 W |
| Voltage and current at | |
| Input, reset and feedback circuit | 24 VDC, 5 mA |
| Auxiliary output and test pulse outputs | 24 VDC/0.5 A |
| AND/OR inputs | 24 V/5 mA DC |
| Times | |
| Delay-on energisation | Monitored reset: 180 ms Automatic reset: 100 ms |
| Delay-on de-energisation | 35 ms |
| Switch-on delay at S35/S36 | 120 ms |
| Switch-on delay | 3 s (after initial start when U_B is applied) |
| Simultaneity channel 1/2 | ∞ |
| Supply interruption before de-energisation | Max. 20 ms |
| Mechanical data | |
| Cross section of external conductors | |
| 1 core | Flexible: 0.25 ... 2.5 mm ² |
| 2 core with the same cross section | Flexible with crimp connectors, no plastic sleeve: 0.25 ... 1 mm ² Flexible, without crimp connectors or with TWIN crimp connectors: 0.25 ... 1.5 mm ² |
| Torque setting for connection terminals | 0.5 ... 0.6 Nm (screws) |
| Dimensions (H x W x D) | 87 x 22.5 x 121 mm |
| Weight | 170 g |

Description

- 22.5 mm P-99 housing, DIN rail mounting
- Outputs use semiconductor technology, short-circuit protected:
 - 2 safety outputs
 - 1 auxiliary output
 - 2 test pulse outputs
- Connection options for
 - Safety sensor PSEN 2.1p-10 and PSEN 2.1p-11
 - Position switch with N/C / N/O combination
 - Reset button
- One AND and one OR input
- Auxiliary output can be switched to a diagnostic output.

Ability to program your own driver to read diagnostic data. The CD "PLC drivers for PNOZelog" is also available as an accessory. This contains ready-programmed drivers for the following PLCs:

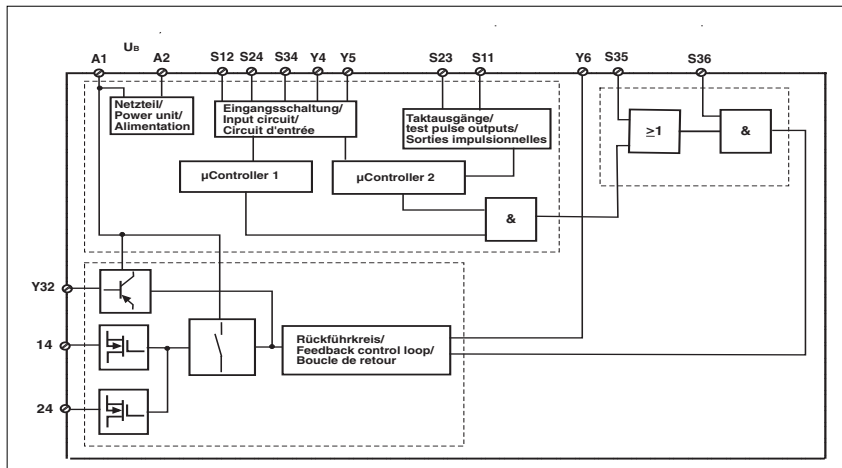
- SIMATIC S7
- LEDs for supply voltage, switch status and fault in channel 1/2
- Shorts across contacts are monitored via the test pulse outputs
- Increase in the number of safety contacts available by connecting expander modules

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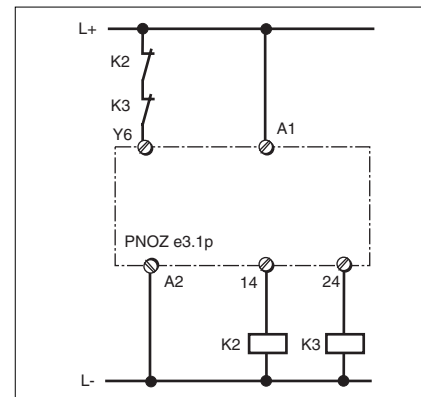
Operating modes

- Dual-channel operation
- Automatic reset
- Monitored manual reset

Internal wiring diagram



- Increase in safety contacts
The number of output contacts can be increased by using expander modules or relays/contactors with positive-guided contacts.

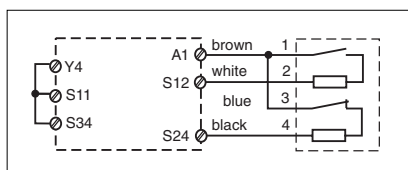


External wiring

The AND input is inactive in all the examples.

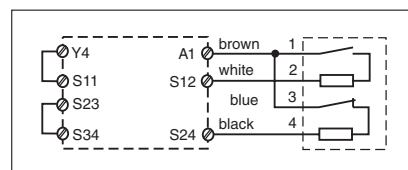
● Example 1

Dual-channel safety gate control with automatic reset, without detection of shorts across contacts and start-up test



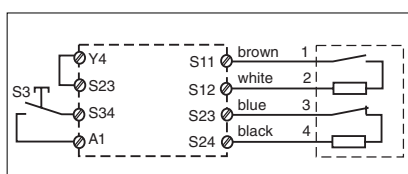
● Example 3

Dual-channel safety gate control with automatic reset, without detection of shorts across contacts and with start-up test



● Example 2

Dual-channel safety gate control with monitored reset, with detection of shorts across contacts and without start-up test



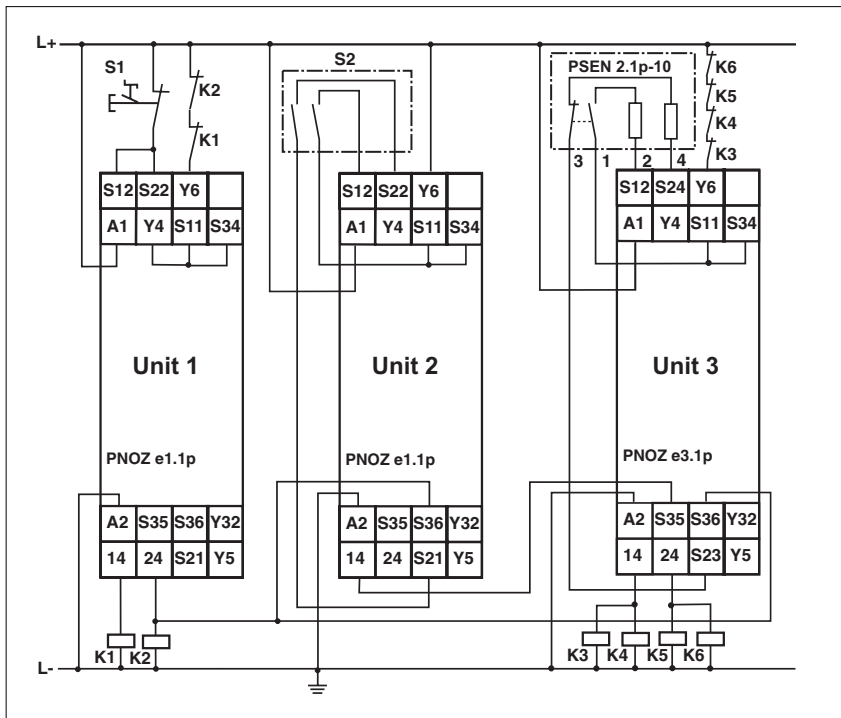
– Key

S3: Reset button

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Connection example

Safety gate application (Unit 3) with
S2 enabling switch for set-up mode
(Unit 2) and master E-STOP (Unit 1)



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General data

Unless stated otherwise in the technical details for the specific unit.

Electrical data

| | |
|--------------------|--------------------|
| Frequency range AC | 50 ... 60 Hz |
| Residual ripple DC | 160 % |
| Contact material | AgSnO ₂ |
| Continuous duty | 100 % |

Environmental data

| | |
|---|--|
| EMC | EN 60947-5-1, 11/97 |
| Vibration in accordance with EN 60068-2-6, 01/00 | Frequency: 10 ... 55 Hz, Amplitude: 0.35 mm |
| Climatic suitability | DIN IEC 60068-2-3, 12/86 |
| Airgap creepage | DIN VDE 0110-1, 04/97 |
| Ambient temperature | -10 ... +55 °C |
| Storage temperature | -40 ... +85 °C |

Mechanical data

| | |
|---|--|
| Torque setting for connection terminals | 0.6 Nm (screws) |
| Mounting position | Any |
| Housing material | Front: ABS UL 94 V0 Housing: PPO UL 94 V0 |
| Protection types | Mounting: IP54 Housing: IP40 Terminals: IP20 |

Units have been tested in accordance with the standards valid at the time of development.

Order reference

| Type | U _B | Order no. |
|------------|----------------|-----------|
| PNOZ e3.1p | 24 VDC | 774 139 |

Accessories

| Description | Order no. |
|--------------------------|--------------------------|
| PLC drivers for PNOZelog | 874 130... ¹⁾ |

¹⁾ **When ordering:** please state the type of licence you require after the order number (..B for basic licence, ..K for copy licence, ..G for general licence, ..U for update licence), e.g. 301 400B.